

What is claimed is:

1           1.    A method of imaging an aorta and aortic aneurysm of a  
2    patient using magnetic resonance imaging, comprising,  
3           performing a first imaging sequence to identify the  
4    location of the aneurysm;  
5           performing a second imaging sequence to image the aorta and  
6    extent of the aortic aneurysm, including,  
7           collecting image data; and  
8           administering magnetic resonance contrast agent to the  
9    patient while collecting image data, by intravenous  
10   infusion, at a rate of infusion sufficient to provide a  
11   substantially elevated concentration of the contrast agent  
12   in the artery during collection of image data  
13   representative of a center of k-space.

1           2.    The method of claim 1 wherein the first imaging  
2    sequence is a sagittal T1 weighted sequence.

1           3.    The method of claim 1 wherein the second imaging  
2    sequence is a plurality of images constructed from a dynamic 3D  
3    volume.

1           4.    The method of claim 3 wherein the plurality of images  
2   include a plurality of coronal, sagittal or oblique projections.

1           5.    The method of claim 1 further including the step of  
2   performing at least a third imaging sequence for imaging the  
3   size of the aortic aneurysm.

1           6.    The method of claim 5 further including the step of  
2   performing a fourth imaging sequence for imaging the size of the  
3   aortic aneurysm wherein the third and fourth imaging sequences  
4   are a plurality of sagittal and axial 2D time-of-flight images.

1           7.    The method of claim 5 wherein the third imaging  
2   sequence is a plurality of sagittal or axial 2D time-of-flight  
3   images and further includes collecting imaging data while the  
4   patient suspends respiration.

1           8.    The method of claim 1 further including performing a  
2   fifth imaging sequence for imaging right renal arteries.

1           9.    The method of claim 8 wherein the step of performing  
2   the fifth imaging sequence further includes collecting phase  
3   contrast images.

1           10. A method of imaging aorta or aortic aneurysm using  
2           magnetic resonance imaging, comprising,

3           performing a first imaging sequence to identify the  
4           location of the aneurysm;

5           performing a second imaging sequence to image the aorta and  
6           extent of the aortic aneurysm, including,

7           collecting image data; and

8           administering magnetic resonance contrast agent to the  
9           patient prior to collecting image data, by intravenous  
10          infusion, at a rate of infusion sufficient to provide a  
11          substantially elevated concentration of the contrast agent  
12          in the artery during collection of image data  
13          representative of a center of k-space.

1           11. The method of claim 10 wherein the first imaging  
2           sequence is a sagittal T1 weighted sequence.

1           12. The method of claim 10 wherein the second imaging  
2           sequence is a plurality of images constructed from a 3D volume.

1           13. The method of claim 12 wherein the plurality of images  
2           include a plurality of coronal, sagittal or oblique projections.

1           14. The method of claim 10 further including the step of  
2 performing at least a third imaging sequence for imaging the  
3 size of the aortic aneurysm.

1           15. The method of claim 14 further including the step of  
2 performing a fourth imaging sequence for imaging the size of the  
3 aortic aneurysm wherein the third and fourth imaging sequences  
4 are a plurality of sagittal and axial 2D time-of-flight images.

1           16. The method of claim 14 wherein the third imaging  
2 sequence is a plurality of sagittal or axial 2D time-of-flight  
3 images and further includes collecting imaging data while the  
4 patient suspends respiration.

1           17. The method of claim 10 further including performing a  
2 fifth imaging sequence for imaging right renal arteries.

1           18. The method of claim 17 wherein the step of performing  
2 the fifth imaging sequence further includes collecting phase  
3 contrast images.

1           19. A method of imaging portions of the aorta or its major  
2 branches in a patient using magnetic resonance imaging,  
3 comprising,

4           performing a first imaging sequence to identify the  
5 location of the aorta;

6           performing a second imaging sequence to image the lumen of  
7 the aorta, including,

8           collecting image data representative of the center of  
9 k-space while the patient suspends respiration; and

10          administering magnetic resonance contrast agent to the  
11 patient, by intravenous infusion, at a rate of infusion  
12 sufficient to provide a substantially elevated  
13 concentration of the contrast agent in the artery during  
14 collection of image data representative of a center of k-  
15 space.

1           20. The method of claim 19 wherein the first imaging  
2 sequence is a sagittal T1 weighted sequence.

1           21. The method of claim 19 wherein the second imaging  
2 sequence is a 3D gradient echo volume.

22. The method of claim 19 further including performing a third imaging sequence for collecting 3D phase contrast images following the step of administering magnetic resonance contrast agent.

23. A method of imaging aorta or renal arteries of a patient using magnetic resonance imaging, comprising,

performing a first imaging sequence to identify the location of the aorta and aorta branch vessels;

performing a second imaging sequence to image the lumen of the aorta, including,

collecting image data; and

administering magnetic resonance contrast agent to the patient prior to or while collecting image data, by intravenous infusion, at a rate of infusion sufficient to provide a substantially elevated concentration of the contrast agent in the artery during collection of image data representative of a center of k-space.

24. The method of claim 23 wherein the step of performing the second imaging sequence includes collecting at least a portion of the image data while the patient suspends respiration.

1           25. The method of claim 23 wherein the step of performing  
2   the second imaging sequence includes collecting at least a  
3   portion of the image data corresponding to the center of k-space  
4   while the patient suspends respiration.

1           26. The method of claim 23 further including the step of  
2   performing at least a third imaging sequence for imaging the  
3   size of the aortic aneurysm, after the second imaging sequence.